THE OHIO JOURNAL OF SCIENCE

Vol. XXIII MAY–JUNE, 1923 No. 3

THE AIMS OF SOCIAL EVOLUTION.*

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Last year Professor R. C. Osburn addressed us on Some Misconceptions of Evolution. While the conception of *organic* evolution is only very gradually being accepted by the population at large, the rate at which it is becoming an established principle among the educated classes, hastens the need for studying the psychological factors that are shaping *social* evolution. It is clear to a group of scientists that social problems are experimental problems. We are no more able, until we have tried it, to affirm that this or that law is a good one, than we are able to predict the outcome of a new chemical combination on the basis of what we know about cooking or gardening.

For those who regard social problems as fundamentally biological in character, what shall be our attitude toward the teleological aspect of all social reform? In natural science this problem never appears. The scientist is not ordinarily concerned with getting a specific result; he is after the facts that may be observed under controlled conditions, and when these are recorded he begins his interpretations quite oblivious of the fact that his guinea pigs do not hold his experiment in high esteem.

When a sociologist or a psychologist is asked to pass judgment on some contemplated social reform, he is expected to estimate its value in terms of *good* or *bad* in addition to predicting its probable influence on existing conditions. When the conscientious investigator seeks a standard of value on which to base his teleology, he finds the literature on this topic overwhelming. He is chagrined to learn that every one seems to know what is good and what is bad, except himself. He may

* Retiring President's Address before the Ohio Academy of Science, March 30, 1923.

rest on some such statement as, a good social reform is one that increases the total *happiness* of all concerned. His curiosity as to the nature of happiness may expire when he learns that happiness is the condition in which internal and external adjustment are in equilibrium.

Before scientific methods can become very effective in social experimentation, it is necessary to establish the direction in which social evolution seems to be going. It is clear that if mankind is to go to the same place where the extinct dodo now is, his social organization ought to be developed along different lines than if he expects to prepare for a career subsequent to his existence on earth. It thus becomes the first problem for the psychologist to determine just what physical and biological science have to contribute toward establishing the probable direction of social evolution. If the search gives promise of a special destiny for man, well and good.

MAN AS A BIOLOGICAL UNIT.

From the biological standpoint man is a product of organic evolution, and the ten thousand years of his historical period have demonstrated his fitness to survive in the struggle with non-human competitors. This survival is not due to his physical strength. His anatomical structures and physiological processes resemble those of the animals so closely that as scientists we ought to assume uniformity in development rather than introduce cataclysmic conceptions based on non-biological entities of a psychic or vitalistic nature. Accordingly we should consider man and his achievements as the product of the same forces and conditions that were in operation before he appeared.

Man as an organism is an aggregate of sensitive, conductive, contractile, secretory, and supporting tissues, grouped together into the organs, structures, and fluids of the body. Within this body the chemical and physical processes of growth, nutrition, reproduction, occur precisely as in animals and if we consider these vegetative processes only, there seems no justification for assuming otherwise than that the human species will inhabit the earth for a time, to be sooner or later displaced by some other form, as different from man as he is from the nearest animal. When, however, we observe the extent to which man's presence has changed the face of the earth and compare his achievements with those of any existing or prehistoric form, we may well wonder whether some principle of discontinuity was not introduced with his coming.

ORGANIZATION.

Suppose we consider first whether cosmic development as far as we can picture it, exhibits discontinuity. According to some of the physicists the universe about us is the totality of two entities and their interactions, called *electrons* and *protons*. The electron is defined as a unit charge of negative electricity; the proton as a unit charge of positive electricity; and the properties are those of negative and positive electricity as described in the physics text-books. The dynamic relations between these entities is expressed as the law that like-signed particles repel each other, while unlike-signed particles attract each other.

The chemical elements are to be regarded as different configurations of electrons and protons, the various atoms differing from each other only with respect to the number of electrons and protons that they contain. There is, however, a limit to the size beyond which the electrons and protons no longer hold together as a single *atomic structure*. This limit seems to have been reached by radium which is unstable under any known present conditions, and is continually breaking down into the lighter atoms of lead and helium. However, atomic structure does not represent the limit of cosmic evolution, and the next step in organization consisted in the combination of atoms into a *molecular structure*. Molecules combined to form chemical compounds, minerals, substances. As the culmination of inorganic complexity we find *crystallization* in which a given geometrical form of molecular organization may grow in size by the addition of the free molecules in a supersaturated solution.

The next apparently discontinuous step in cosmic organization was the appearance of the larger *protoplasmic structure;* stable with respect to organization, but unstable with respect to molecular composition. While the protoplasmic element (the cell) is larger and more complex than any organic molecule, it also is limited in its size by a surface-mass ratio which is at an optimum between one-fiftieth of a millimeter for the larger protozoa, to whatever may be the size of the smallest filter-passing bacteria.

The development of a *multicellular structure* was the next discontinuous step in the direction of complexity in the organization of the electron-proton systems. From the smallest

scarcely visible multicellular forms whose weight is given in milligrams, we pass by intermediate steps to the huge prehistoric herbivora whose mass is calculated in thousands of kilograms. Apparently we have here reached the limit of size and complexity in the multicellular type of organization. The large herbivora became extinct and even the larger existing mammals (aside from man's interference) are decreasing in number and are also facing extinction. The reduction in size of the multicellular type has not been equal in all the tissues. In the progenitors of man, the central nervous tissue actually increased in proportion to the other tissues. The direct effect of this increased brain capacity resulted in an increase in the number of interconnections between the sense organs and the muscles. Instead of independent reflex sensory-motor mechanisms, the interconnections which became possible as the brain enlarged, increased the range of the stimuli which could release a given reflex mechanism. The complexity of behavior was then more closely correlated with the *combination of stimuli* than it was with complexity in inheritance. This was the beginning of what we now call learning through experience. The animal's behavior no longer depended solely on specific inherited connections but new environmental conditions were able to produce modifications which individualized the organism and made it possible to develop reactions that were not laid down by inheritance. Science is just beginning to recognize that this greater behavior range is another discontinuous step through which cosmical organization has been extended beyond the simple multicellular type of the large prehistoric herbivora to a *compound multicellular structure* to which we now give the name of *social organization.*

In the relatively unsocialized animals the specialization of the different tissues had already produced a high degree of co-operation between the parts of the body. This interdependence of the various tissues, however, became so complex that the probability of fatal abnormalities became too great. The inadequate function of a single organ, kills the whole organism. With social organization for the group even though the individuals are very highly specialized for certain necessary activities, the death of one individual does not destroy the whole community, as for instance, the death of the heart will destroy the whole body. In other words, the difference between man and the animals lies in man's greater behavior potential-

ities, and this is due to a greater variety in the interconnections between sense organs and muscles. This seems at first to be an insignificant distinction but it made language possible and proved of such great survival value that it placed man so far from the animals that his *relationship* to them is still denied by the population at large and has only been accepted by the scientists during the last seventy-five years.

SUPER-VARIABILITY.

If the essential difference between man and the animals lies in the fact that man's movements are more correlative with the variety of the stimulus combinations which act upon his sense organs, suppose we consider the hypothetical conditions that would produce the maximum variability in human behavior.

Primitive man, as compared with civilized man, is limited in the variety of his behavior by the limited range of his sense organs. At best he can only react to objects within his visual range, a distance of hardly more than a few miles. If an ideal individual existed whose eyes could at any moment, see all the things that have occurred in the past, that are now occurring all over the world, and that will occur in the future, such a superman would exhibit a diversity in his behavior far beyond that of any normal man. With such eyes the superman could discriminate environmental details beyond the range of the normal individual. Such eyes are of course, a physical impossibility but we shall presently see that certain social institutions really make it possible to approach this all-seeing condition. Suppose further that our superman possessed perpetual youth, absolute immunity against disease, the best possible inheritance, unlimited physical strength, and unfailing food and shelter resources. Even if such a superman lived at the same place and time as a normal individual his behavior would differ from that of the normal man. The biological structure of the normal individual is such that many of the environmental stimulating conditions do not produce correlative sensory-motor changes. In our superman the normal biological limitations do not exist and hence his sensory-motor changes would exhibit a higher degree of correlation with the environmental conditions. This is what we mean when we say that the superman is in better equilibrium with his environment than is the normal individual.

Compared with the normal man, our superman may be characterized as omnipresent, omniscient, and omnipotent. In the cosmical sense the superman is an aggregate of electron-proton systems whose changes exhibit the maximum correlation with the changes that are occurring or have occurred in all the other electron-proton systems in the universe. *Homo sapiens* approaches the variability of our superman to a greater extent than does any other animal but even the best endowed individual is far from the ideal. Yet, I expect to show that social organization is one of the devices by which normal man comes nearer to our superman.

We now pass on to consider more in detail some of the limiting conditions which separate the existing man from the superman.

BIOSOCIAL LIMITS TO VARIABILITY.

The most important conditions which limit the freedom of action of the normal individual may be grouped under five headings: (1) The limitations of disease and death; (2) Limited sensory capacity and restricted environment; (3) Limitations through faulty inheritance; (4) Limitations through essential food and shelter activities; (5) Limitations imposed by the competition between individuals.

To anticipate our conclusions we may provisionally regard human institutions and organizations as agencies by which man actually overcomes some of these limitations, and that social reform or social changes are directed toward developing the one best type of organization that will make it possible to secure the maximum variability for each individual and thus produce indirectly an electron-proton organization which approaches the omnipresence, omniscience, and omnipotence, of our superorganism. We pass on to a consideration of the extent to which social organization has already overcome many of the limitations against the maximum variability in behavior.

(1) *The Limitations of Disease and Death.* Under favorable conditions the span of life lies in the neighborhood of seventy years, the average length between forty and fifty. It is clear that if the individual lives to three hundred years and retains perfect health during this period, the variety and number of his achievements would be greater than they are now, just as under primitive conditions they were less than at present. From the development of medicine since primitive times we see that the

activities of the physician have become very specific. Medical education and the various types of treatment now represent varieties of behavior that are very complex and take up the full time of a considerable percentage of the population. Through the innate variability of the best endowed individuals, medical research has developed sanitary and hygienic methods which have displaced the ritual and magic of the primitive medicine man. The greater complexity in medicine requires every other member of the community to increase his output in order to furnish the food and shelter for the medical profession, but on the whole, the actual leisure of the community is increased, and the probability of still more effective inventions and discoveries becomes greater.

The following are some of the social institutions and co-operative forms of behavior which reduce disease and delay death: Medical education, hospitals, preventive medicine, sanitation, safety first methods, vital statistics, etc. These institutions can only exist under a very complex form of social organization, but even the most advanced medical practice and organization is hardly more than a beginning. Such very effective methods as health control through heredity have not even been tried. It seems reasonable that in so far as medicine is a factor in social evolution it points to an increase in the size and the complexity of social organization, and adds variety to human behavior.

(2) *Limited Sensory Capacity and Restricted Environment.* Anatomically the sense organs of man are of the same general type as those of animals. He sees, hears, smells, tastes, feels, in about the same way, in some cases more accurately, in others less. The animal is limited; qualitatively, by the lack of sense organs for the discrimination of such physical forces as electricity, magnetism, certain forms of radio-activity; spatially, by the fact that a radius of at most a few miles represents the maximum distance at which a stimulus may act; and temporally, in that only the stimuli that occur in the immediate present can be effective in modifying its behavior. Compared with the savage, civilized man has enormously extended the range of his sense organs and his environment by the invention of language. Through language man is able to practically reproduce environments that have occurred in the past or may occur in the future, or which are occurring now but are beyond the limit of direct observation. Thus by the aid of historical language

records, man may at any time reproduce situations that occurred centuries before he was born. Through the newspapers, magazines, books, illustrations, the cinema, he can extend his environment to any part of the earth. Through his radio outfit he is able to hear New York's latest jazz. Through advanced weather reports he is able to adjust himself to temperatures that will not act on his cutaneous receptors for many hours. Contrast this with the limited sensory range and restricted environment of primitive man and we see how the range of modern behavior is extended, not only for the individuals who use the devices but also for those who develop and produce them. These inventions and the social organization through which their products are distributed have the virtual effect of placing the sense organs and the environment of every individual, living or dead, at the disposal of every other individual. We have learned how the past, present and future, the near and the far, can be stored in a library.

The following devices and institutions extend the sensory range and the environment of civilized man and thus produce greater variability in his behavior. Formal historical records, and the many forms in which language manifests itself, cinema, photographs, and other forms of representative art, microscopes and telescopes, radio, power, travel.

It is only by marshalling such an imposing list of social achievements that we get an idea of how the development of the central nervous system has made possible a degree of interaction between organisms entirely beyond the anatomical possibilities. Social organization in the realization of its potentialities will unite all men into one gigantic organization, the individual units of which are only multicellular organisms that exhibit *both* uniformity and variety in their behavior.

(3) *Limitations Through Faulty Inheritance.* Under any given set of environmental conditions all the individuals of a group do not develop the same reactions. Some individuals meet new situations by improving upon established forms of behavior; others cannot even learn to imitate the established reactions. There are thus differences between individuals that are traceable to differences in the type of nervous system that is inherited, and these differences may range from an imbecility which would result in the speedy death of the individual if left to himself, through various stages of dependence and independence, up to the leader who invents and discovers many

new forms of behavior better adapted for survival than those that have been established. Excellence in inheritance thus manifests itself as a quicker learning and an improvement of the standardized reactions. Good inheritance has been recognized as such an important factor in social adjustment, and as occurring so rarely, that most individuals are taught to *imitate* the behavior of the well endowed rather than to rely upon their own innate ability. This results in behavior that is considerably above the average inheritance level of the group. Factory methods make it possible to produce cheaper and better products with workers of poorer inheritance and training than did the older handicrafts. This should release the abler workers for further research, but at present this better inheritance goes to produce profits for private individuals instead of for the community. It is only very seldom that the inheritance and training of the profiteers is directed toward improving the type of social organization.

When the inheritance of the individual is so poor that he does not learn the standardized reactions, as in insanity, feeblemindedness, idiocy, the persistently criminal, the unemployable, he becomes a charge on the community and does not even contribute his share toward the maintenance of the social organization. This further drains off the resources into nonproductive channels.

The home, tradition, law, education, division of labor, etc., make it possible to use types of inheritance that would be speedily eliminated under more rigorous primitive conditions but no fundamental scientific attempt has been made to improve the germ plasm of mankind.

(4) *Limitations Through Food and Shelter Activities.* Under frontier conditions practically the whole time and energy of the family are devoted to securing food and shelter and these are of the simplest kind. One of the first steps after social co-operation has begun is to establish some kind of religious or educational activity which introduces variety into the behavior of the younger generation and prepares them for participation in still more variable forms of behavior. Roads and transportation facilities are improved and through the division of labor and the use of machinery the time and energy devoted to food getting are much reduced, and the greater leisure is expressed in a greater variety and better quality of food and shelter. Perhaps in no other field of human activity has social organization pro-

duced such a variety in behavior as in the preparation of dress, food, and shelter.

It is difficult to name a social activity that does not in some way relate to food and shelter, but among the institutions which reduce the time and energy devoted to securing them we may mention: factory methods, transportation, refrigeration, improved agriculture, improved housing, and such indirect methods as insurance, pensions, etc.

From even a hasty consideration of the complexity and variety of institutions such as these it seems evident that biological evolution beyond the huge multicellular forms of the primitive herbivora has taken the form of an increased complexity in behavior, and this in turn is secured through an increase in the relative amount of nervous tissue. If we are correct in assuming that cosmical evolution, in so far as this term has any significance, is in the direction of the formation of larger and more complex aggregates of organized electron-proton systems, the activities of the highly individualized multicellular form known as man, exhibits this tendency in his food and shelter organization in an almost irrefutable clearness.

(5) *Limitations Imposed by Competition.* While competition introduces variety into the behavior and develops inventiveness for a few of the abler members of the group, too large a proportion of it is directed toward decreasing rather than increasing the community's resources. Under primitive conditions where social organization is limited to rather small groups, competition in the shape of war may take up all the time and energy of a considerable part of the group. Even under modern peace conditions there is a constant lack of balance between the workers and the amount of work to be done which results in an actual reduction in the variety of behavior.

Social organization has made least progress in the elimination of useless competitive behavior. The most effective instrument, that of scientific research, has scarcely been introduced. Such institutions as civil service, vocational or specialized training, labor unions, employers' organizations, producer's organizations, trusts, treaties, and agreements, have eliminated or regulated competition, between particular groups of individuals; but this is usually nothing more than a transference to a less organized group. Thus the coal operators may combine to limit competition among themselves, the miners may organize for higher wages, but there is no decrease in the cost of coal to

the unorganized consumer. However, ineffective modern business methods may be from the scientific standpoint or as compared with engineering, they are the first steps toward a more equitable distribution of commodities which in turn will result in greater variety in behavior.

LIMITED VARIABILITY.

We have seen how social organization is a device for overcoming the restrictions which limit the variability of human behavior, particularly as referring to disease and death; sensory capacity and restricted environment, faulty inheritance, essential food and shelter activities, and competition. We profess to see in this a cosmical evolution of electron-proton aggregates into a greater and more complex organization. The evolution is not smooth and uninterrupted. At times the processes of disorganization seem to have the upper hand. Thus it is urged that as economic pressure is removed the variability of man's behavior becomes less rather than more; that if man is required to work less he will loaf more. This is undoubtedly true for a large proportion of the population at present. For most individuals greater leisure is merely an opportunity to "catch up sleep" or to secure the required rest for adequate metabolism. Aside from the inactivity that greater leisure induces under unfavorable nutritive and shelter conditions, the daily tasks are not the ones most individuals would perform if they were independent of their social environment. The behavior which would occur if only inheritance and an irresponsible immersion in a social environment were operative (the so-called instinctive behavior) does not fit the individual for any given social status. In other words, civilization is largely a process of substituting standardized reactions for those that have been inherited. This is a slow process mediated by other individuals (parents, teachers, instructors) not all equally effective in manipulating the environmental conditions for producing the change. Thus, even with similar original endowment, limited variability may result from differences in training.

Another source of limited variability in behavior results from the fact that social organization has produced a standardized behavior which reflects a better inheritance than most individuals actually possess. In other words, the daily activities of the greater part of the population are actually above their inheritance level. If now, the average individual secures

more leisure he will not devote this to art, literature, science, which are on an even higher inheritance level than his vocational activities, but he will *relax* to recreation that is nearer his own inheritance level, the movies, cards, foot-ball, base-ball, hunting, fishing, etc. Unless the individual is educated how to spend his leisure he can only spend it on the level of his own innate capacities, and for the average individual this is not much above that of a normal twelve-year-old child. To expect a laborer to spend his spare time in "improving his mind" is biologically unwarranted until we introduce a eugenic and educational program so different from anything we now have that it need not be considered. Under present conditions there will always be a relapse into more primitive and more instinctive forms of behavior whenever social pressure is removed. Any reform in the direction of better working conditions and shorter hours for the masses which assumes that the added leisure will be devoted to intellectual pursuits, is doomed to failure.

Social organization and the processes of civilization are devices by which man approaches omniscience, omnipotence, and omnipresence, but we can now realize that there is no danger of breaking any speed laws. The unification and the individualization of behavior which represent the biological essentials of this aim, are well started but our social organization is still very far from adequate to enable each individual to develop the maximum variability which could be expected from his inheritance and an ideal educational system.

THE INDIVIDUAL-SOCIAL COMPONENTS IN BEHAVIOR.

As the individual learns to adjust himself to his environmental conditions, his behavior varies in two directions. It may become more like that of other individuals and contribute to the necessary activities of the community, or it may become more individualistic and conform more closely to his inherited sensory-motor conditions. Practically all adult reactions have been highly socialized, yet even in the most standardized reactions a personal or inherited peculiarity can always be pointed out. Every adult reaction began as some infantile reaction in which the inborn or individual component alone was operative. Through the subsequent stimulating conditions, the infantile reaction is changed; either by the addition to it of other movements, by the elimination of some movements, or by the elimination of some and the addition of other (substitution)

movements. Every act that we now perform represents a terminal stage in a regressing series of changes which began with some original or first response. Each step in the series represents a change (small or large) from the preceding step. Theoretically it should be possible to trace back every adult act to some infantile source but the changes are so rapid and the relations between successive steps are so obscure that the analysis into the inherited or acquired components is practically impossible. The cause of each change is usually a social stimulus of some sort, a teacher, book, friend, etc. The further back the series reaches the stronger the individual component manifests itself. The nearer the series approaches the present, the stronger the social component becomes and the more effectively does the behavior establish the social status of the individual. The behavior of every person who actively participates in the workaday activities of the community is being constantly brought into closer unity with a communal or special group average, but the process of socializing is always superimposed upon the individual component, which acts as a desocializing force and tends to individualize behavior.

A concrete illustration will relieve the abstract character of the discussion. Suppose a hundred seniors are asked to write a theme on civics, of a specified length, and within a limited time. Assume that they are free to write on any phase of the subject and that every student does his best. When the papers are examined it is found that not all the papers cover the same phases of the topic. The historical, political, theoretical, ethical, international, industrial, economic phases will be emphasized in very unequal degrees, and will be treated with very unequal degrees of merit. This variety or individualization of the papers even though the instructions for each student were the same, represents the individual component. The fact that the topic of the theme, its length and the interval within which the paper was completed, was practically the same for all students, represents the social or the unifying component in the behavior.

Beginning with the movements of a new born infant which are to be regarded as reflex sensory-motor mechansims either inherited or of embryological origin, there is a gradual increase in the number and complexity of those movements that make up behavior through youth, maturity and old age. The *reaction* to the environment at any given instant may be regarded as one stage in a *series* of reactions which trace backward to

infantile reactions and forward to a terminal stage in the daily life of the individual. The *behavior* at any given instant may be regarded as a *unified* group of reaction segments from different reaction series. The character of each series shows the effect of the environment and inheritance, classified into an *individual* and a *social* component, as follows:

A. The Individual Component.

1. The type of nervous system that is inherited. (pugnacious.)

2. The stimulating conditions that represent the primitive and relatively unsocialized environment. (The out-of-doors.)

3. The effect of inheritance or special training in the synthesis of new reactions.

4. The earlier stage (as compared with the later) of a reaction which is being modified.

5. The type of behavior popularly designated as: an end in itself, recreation, play, personality, originality.

6. The social conditions which differentiate and individualize behavior.

B. The Social Component.

1. The type of nervous system that is acquired. (Obedient.)

2. The stimulating conditions that represent the most recent and most socialized environment. (School or office.)

3. The effect of conventionalized training in the formation of new reactions.

4. The later stage (as compared with the earlier) of a reaction which is being modified.

5. The type of behavior popularly designated as: a means to an end, routine, work, impersonal, and unoriginal.

6. The social conditions which standardize and conventionalize behavior.

THE INDIVIDUAL-SOCIAL COMPROMISE IN BEHAVIOR.

The life history of the individual represents a series of compromises between the actions which he actually performs and the ones he would perform if left to himself. The question arises, why does the individual modify his behavior to conform with the unity demanded by society? The answer is that many individuals (the socially abnormal) *do not.* But under ordinary conditions the *social* environment into which the individual is born, soon becomes the strongest stimulus. This means that our social organization from the very beginning presents stimulating conditions (education) that unify behavior rather than individualize it. The *innate* tendencies are in the direction of individualization and usually opposed to socialization. There is so to speak, a constant fluctuation between old and new forms of behavior. Often it is impossible to enumerate the conditions which cause either the new or the old forms of behavior to appear, and to the individual there seems to be a conflict which he is able to decide through some sort of a mental act that is independent of the stimulating or nervous conditions which are operative at the time. This is an illusion and merely an

expression of the fact that the individual is unable to designate what biological causes were effective in the action that actually prevailed.

As a problem in social organization we may agree that the more the individual component can be made to contribute to socialized behavior, the nearer do we approach the maxim effectiveness of the individual as a member of a given social organization. In order to participate, the individual must act on a schedule and fit his behavior into a system which may deviate widely from his individual schedule or system. The ideal conditions would be those in which the unmodified individual behavior plan would fit into some phase of the social plan. Such an ideal synchronism between the individual and social components occurs very rarely, but for each individual there is a social plan which fits his innate capacities better than any other. Thus to make a professional musician out of a child whose innate musical ability is low, will require more supervision and training per unit of improvement than in the case of a child who has inherited musical talent and for whom work in music would be individual behavior. If further, the musical individual is able to use his talent to meet his vocational requirements, as in teaching music, musical composition, conducting an orchestra, etc., his socialized activities will be almost identical with his innate capacities. This will give the most favorable conditions for developing the *art* of music. Speaking generally this means that the individual's innate endowments may contribute socially necessary activity. His work then becomes his hobby; work becomes play; the right man is in the right place; etc.

The individual-social compromise in behavior is merely a statement for the fact that every adjustment that an individual makes to a new environment is a compromise between an older established reaction to the nearest similar environment, and the new stimulating conditions that produce a change in the established reaction.

HAPPINESS.

In the more democratic forms of government any reform which would entail a permanent reduction in the total so-called happiness would be regarded as a failure. This will generally be accepted as a fundamental principle, but when we actually examine what the phrase means, we find it so vague that it will

support any argument. The writers on ethics are agreed that any attempt to designate the concrete circumstances under which a given individual will be permanently happy is hopeless. It is not my intention to consider happiness from the ethical standpoint, but as a *relationship* between the amount of individual behavior, and the amount of socialized behavior.

From the cosmical standpoint we found that the superiority of man over the animals was due to the greater variability of man's behavior. Therefore any condition, which, in the long run, favors variability in behavior has a survival value, and any condition which limits variability, has no survival value. In other words, "the active man will inherit the earth and the lazy man will perish." Can we say that the greater the activity, the greater the happiness? If activity is taken in the strictly muscular sense, as the amount of chemical energy converted into heat and work, then activity and happiness have nothing to do with each other. Evidently the *kind* of activity is important. It is usually recognized that greater activity is shown when the individual component (play) predominates than when the social component (work) predominates. Without taking the quantitative aspect too critically we may regard the individual component as the numerator and the social component as the denominator of a ratio which roughly measures what we may call biological happiness. The greater the ratio the greater the happiness. Neurologically, happiness means that the nervous system of the individual is being exposed to those environmental conditions which support the maximum individualization of behavior. Happiness in this sense is not a vague psychical feeling or a mysterious entity within the individual. It is merely an indication that the activities of the individual are conforming to those biophysical and cosmical principles which will in the long run produce larger and more complex electron-proton aggregates and larger and more complex social organizations.

Much of the popular theory on social organization assumes that an increase in happiness also entails an increase in misery at some other point, and the extreme view that happiness is in some way an evil, still has adherents. The more highly organized a community may be, the greater are the possibilities for using the innate capacities of the individuals for increasing the effectiveness of the standardized or required activities. It is possible therefore, to reduce the essential drudgery in life to a minimum. Through such devices as job analysis, individual

analysis, and by fitting the two together, the individual-social ratio (standard of living) of the population can be raised enormously.

Through the aid of written language the range of the sense organs is much increased; industry, machinery, power, sanitation, have removed other limitations against the freedom of behavior. However, the very conditions by which some limitations are overcome also introduce new standardized forms of behavior. In fact, under our present highly civilized and specialized system, the life of an unskilled laborer may actually be less individual than that of a savage. The boredom of the idle on the other hand, is often merely the social condition in which the training of the individual has not gone far enough to prepare him for the type of variety available under the social conditions. By clearly recognizing that civilization is merely a device for extending the range of human variability in behavior, the conception of human happiness can be given a biosocial significance which is relatively independent of the fluctuating ethical and moral standards which vary so much from country to country and from decade to decade. The aim of civilization then becomes one of co-operation for creating opportunities so that every individual while on earth may establish an optimum relation between his individual and social components in behavior. Such a conception reveals clearly that happiness can only be a reciprocal process. The behavior must conform with our inherited and acquired capacities and in the long run must be in the direction of increasing the total variety of behavior through the development of larger and more complex forms of social organization.

In so far as social science has developed a working hypothesis, this is based on the old assumption that man is the center of the universe and that everything revolves around him. It is assumed that man knows what he wants and the only reason he does not get it is because he is so selfish that he wants more than the available resources of the earth can supply. That happiness is not a matter of wealth, we know, even though most of us are willing to take a chance on handling a larger amount of it than we actually possess. As a matter of fact we do not know what conditions are most favorable for happiness. This is just as much an experimental problem as any medical problem. The greatest development which can take place in social theory would be the recognition that human behavior is not the

result of hate, love, fear, anger. These are but names that came into use before we knew the biological basis of behavior. When a man has an epileptic seizure we no longer say he is possessed of the devil; why should we ascribe the act of murder to the devil of revenge? It is high time that the brain and nervous system are regarded as biological structures rather than supernatural agencies in radio communication with a celestial spirit reservoir. It is the brain and nervous system that is the organ of behavior and the brain is no more the organ of an abstract intellect than the heart is the organ of love. Whatever we may include under the term happiness, it is a problem for science, not for poets, politicians, or mystics.

THE HISTORICAL BEHAVIOR RECORD.

A much larger percentage of the population is beginning to see that human behavior need not be regarded as the product of unknown forces originating out of magical and superstitious principles. The improvement and the more widespread teaching of science and of history reveal a uniformitarianism between successive historical periods which is of the same order as that of the geological or biological record. The educated man is slowly beginning to class human behavior with human digestion, respiration and circulation. From a statistical analysis of the behavior of historical persons and groups, hypothetical life histories and behavior types are being developed and incorporated into our educational system as biological factors in the modification of conduct. From the historical record, man's destiny seems to be a biosocial destiny. What he does depends on the type of nervous system he has inherited and the social environment into which he was born. Today's behavior is the result of yesterday's actions and the cause of tomorrow's behavior. Individuals are forming groups, groups are forming federations, states, nations, alliances, and an attempt has even been made to form a league of nations. The final stage in which all peoples on earth will be united through some organization may be a long way off, but it is biologically inevitable. War cannot prevail because it can only use scientific methods destructively and soon becomes self-limiting because of the expense. At present it is a race between science in social organization and science in war, in which scientific social organization will eventually prevail.

SUMMARY.

Cosmical evolution is a relatively discontinuous process in the direction of an increase in size and an increase in complexity of the ultimate electron-proton elements out of which the universe is constructed.

The *inorganic* organization of electrons and protons produced the atom, the molecule, the crystal; the *organic* organization of the molecule reached one limit in the protoplasmic cell and a second limit in the large multicellular herbivora. *Social* organization begins with the development of the multicellular organization such as the bees, ants, wasps, and terminates in man. The relatively greater amount of nervous tissue in man's progenitors resulted in a greater variety in their behavior. A greater variety in behavior made possible an adjustment to environmental conditions for which no specific provision had been made by inheritance. This has been called learning by experience. The social organization of man is a double process: one phase directed toward an individualization of behavior; the other toward a standardization of behavior. The aim of social evolution as a cosmical process is that of producing larger and more complex electron-proton aggregates, but as a human process, the aim of social evolution is that of developing a social organization that will yield for each individual a maximum of individualization with a minimum of standardization. The ultimate realization of these conditions will produce a social organization and a type of individual that have as upper limits those conditions best described as omnipresence, omniscience, and omnipotence.

To rephrase this less technically and stressing popular conceptions of little scientific utility, we may say that man's morality, his culture, his aims, and his aspirations, are limited by certain biological restrictions. Within these restrictions his behavior may vary between wide limits. The best morality, the best culture, can only be determined by scientific methods. They cannot be determined by the methods of poetry, magic, of superstition. When the best morality, the best culture, have been determined, their achievement will again depend upon a scientifically developed social organization.

When we contemplate what science has done for us let us realize that so far we have only been called upon to *accept*. Will we *give* to science with as good grace?

Physical science has given us better shelter, better transportation, better communication, better of all that which is material and has asked naught of that which is based upon our emotional heritage.

Biological science has given us better food, better bodies, better of all that through which man's conduct may express itself, but in its demand upon our faith and belief in the theory of organic evolution it is asking for what to us, at one time *seemed* a spiritual sacrifice, and *is still*, a spiritual sacrifice for unschooled mankind.

Social science has given us better protection, better organization, better training, better of all that through which man approaches a destiny which we only fearfully and with awe contemplate as omnipresent, omniscient, and omnipotent, but its demand upon our courage to sacrifice long cherished beliefs and ideals, to a cold but inexorable scientific method which brands many of them as illusions and errors, is now all but impossible for the elect in knowledge and unthinkable for humanity in the large. Will we learn to give of our great faith in tradition, as freely as we have accepted our greater creature comforts?